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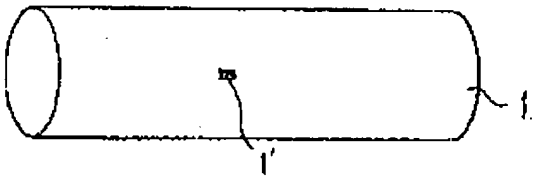
(54)【発明の名称】　テープガイド

(57)【要約】
【課題】繰り返し走行における摩擦係数の上昇を抑え、テープ損傷を抑え、安定したテープ走行を得る。
【解決手段】磁気テープのベース面と接触する金属の固定ピンの表面粗さを０．２ｓ～０．７ｓとし、その表面の５～３０％の部分に深さ１μｍ～１００μｍの微小な凹部を設ける構成とする。

図１



1

【特許請求の範囲】
【請求項1】磁気記録再生装置の磁気テープの走行路に配置される非回転式のテープガイドにおいて、
前記テープガイドのテープ巻装面の表面粗度は0．2sないし0．7sとされ、
前記テープ巻装面の表面積の5％ないし30％の面積比の部分に、その深さが1μmないし100μmの深さを有する凹部が設られてなることを特徴とするテープガイド。
【請求項2】前記表面粗度は、さらに0．3sないし0．5sとされてなることを特徴とする請求項1に記載のテープガイド。
【請求項3】前記表面粗度は、さらに0．35sないし0．45sとされてなることを特徴とする請求項1に記載のテープガイド。
【請求項4】前記凹部の設けられた面積比は、さらに10％ないし25％とされてなることを特徴とする請求項1ないし請求項3のいずれかに記載のテープガイド。
【請求項5】前記凹部の設けられた面積比は、さらに15％ないし20％とされてなることを特徴とする請求項1ないし請求項3のいずれかに記載のテープガイド。
【発明の詳細な説明】
【0001】
【発明の属する技術分野】本発明は、ビデオテープレコーダ（VTR）やデータレコーダ等の磁気記録再生装置の非回転式のテープガイドに関するものである。
【0002】
【従来の技術】従来より、VTRやデータレコーダ等のヘリカルスキャン方式の磁気記録再生装置では、図4に示すように、テープカートリッジ11内の供給リール11a．巻取リール11bに巻装された磁気テープ10をドラム入側ガイド1、6．ドラム出側ガイド2．7、テンションピン3等の移動するローディング部材によって矢印方向に引き出して、回転ヘッドドラム10の周面に所定角度にわたってヘリカル状に巻き付け、シャーシ12上の非移動ガイド4、5．8とともに所定の走行路を形成する。そして、磁気テープ10は巻取リール11bに係合する巻取リールモータ（図示せず）により定速走行する。このとき、回転ヘッドドラム10に搭載された回転磁気ヘッド（図示せず）により磁気テープ10に信号の記録あるいは再生を行うように構成している。
【0003】次に、磁気テープ10の走行路を形成するガイドについて説明する。ガイドには、磁気テープ10に対し垂直に巻き付ける垂直ガイド（6、7など）と、磁気テープ10に対し斜めに巻き付ける傾斜ガイド（1．2）がある。垂直ガイドにおいては、非回転式の丸棒状の直立ガイドピン3．4と、回転式のローラである回転ガイドローラ5、6．7、8．9とがある。また．傾斜ガイドには、直立ガイドピン3、4と同様に非回転式の丸棒状の傾斜ガイドピン1．2が用いられる。

2

【0004】
【発明が解決しようとする課題】ところで、回転式の回転ガイドローラ5、6、7．8、9においては．磁気テープ10との摩擦はほとんど無視することができるが、非回転式のガイドピン1．2、3、4においては磁気テープとの摩擦が問題となってくる。特に、磁気テープとの巻き付け角が大きいガイドピン（ここでは、ドラム入側傾斜ガイドピン1、ドラム出側傾斜ガイドピン2）において摩擦の影響が大きい。
【0005】図7は、従来の非回転式のガイドピン1について、磁気テープ10のベース面との摩擦係数を測定したときの結果を示したものである。
【0006】この摩擦係数の測定には．図5に示した摩擦係数測定器を用いた。これは、ガイドピン1に磁気テープ10を所定の巻き付け角θに巻き付けて、磁気テープ10の一端に荷重15（ここでは10g）を与え、他端を歪みゲージ（図示せず）を取り付けてあるテープ走行手段16によって一定の速度（ここでは25mm／s）の磁気テープ10は繰り返し矢印方向に往復走行するようになっている。そのときの磁気テープ10のテープテンションT1、T2を測定し、摩擦係数を求めた。
【0007】図7によれば．磁気テープ10は走行開始の摩擦係数は0．17であるが、走行回数が1000回（1往復を1回とする）で0．4まで上昇している。磁気テープ10との摩擦係数が上昇すると、磁気テープ10がテープガイド1を通過するときのテープテンションの増加が走行回数が増す毎に大きくなる。このため、繰り返し走行を行うと、磁気テープ10の摩擦係数やテープテンションが高くなるため、特にテープ厚の薄い薄手テープを走行させると、垂直ガイドであるガイドローラ5．6、7、8．9の上下フランジで磁気テープ10のダメージを受けやすく、磁気テープ10の寿命が短くなる。
【0008】また、摩擦係数が大きくなりテープテンションが高くなると、巻取リール11bに係合している巻取リールモータにかかる負荷が大きくなるため．回転変動や偏差が大きくなり、磁気テープの走行が不安定となる。
【0009】本発明は、上記の問題を解決するためになされたもので．低コストで．しかも磁気テープの安定したテープ走行が得られるテープガイドを提供することを目的とする。
【0010】
【課題を解決するための手段】上記の目的を解決するため．本発明では以下の構成を採用する。すなわち．磁気記録再生装置の磁気テープの走行路に配置される非回転式のテープガイドにおいて．前記テープガイドのテープ巻装面の表面粗度は0．2sないし0．7sとされ、前記テープ巻装面の表面積の5％ないし30％の面積比の部分に、その深さが1μmないし100μmの深さを有

する凹部が設られてなる構成とするまた、前記表面粗度は、さらに0．3sないし0．5sとされてなる構成とする。

【0011】また、前記表面粗度は、さらに0．35sないし0．45sとされてなる構成とする。

【0012】また、前記凹部の設けられた面積比は、さらに10%ないし25%とされてなる構成とする。

【0013】また、前記凹部の設けられた面積比は、さらに15%ないし20%とされてなる構成とする。

【0014】

【発明の実施の形態】以下、本発明を適用した磁気記録再生装置のテープガイドを図1～図3を参照して説明する。なお、装置全体の構成は従来と同一であるため説明の重複を省く。

【0015】図1は、ドラム入側に配置される傾斜ガイドピン1を示したものである。図2は図1に示す傾斜ガイドピン1の表面の微小な斜線で示す部分1′を拡大したもの、図3は図2の点線部における断面を示したものである。

【0016】図1から図3に示すように傾斜ガイドピン1の表面1a部の表面粗度は0．3s～0．5sであり、一部分に深さ1μm以上の凹部1bが設けられており、凹部1bの占める割合は、表面全体の10～25%となっている。

【0017】なお、前記表面粗度は、少なくとも0．2sないし0．7sとすればその効果が得られ、最適には、さらに0．35sないし0．45sとすればよい。

【0018】また、前記凹部の設けられた面積比は、少なくとも5%ないし30%とすればその効果が得られ、最適には、さらに15%ないし20%とすればよい。

【0019】本発明の傾斜ガイドピン1と磁気テープ10との摩擦係数を従来と同一条件で測定した結果を図6に示す。図6に示すように走行開始の摩擦係数は0．2であり、数十回の走行で0．19まで減少し、その後徐々に増加しているが走行回数が1000回に達しても摩擦係数は0．2であり、変動幅は0．01と小さく、従来のガイドピンのような異常な上昇がないことがわかる。

【0020】上記に示した傾斜ガイドピン1の表面形状は、磁気テープ10のベース面側と接触するガイドピンのすべてに適用しても同様な効果が得られる。したがって、ドラム出側に配置される傾斜ガイドピン2さらにはテープテンションを検出するテンションアーム17上に配置されるテンションピン3においても適用することで、テープテンションの上昇を最小限に抑えることができる。

【0021】次に、凹部1bの形状について説明する。凹部1bの形状は、上記した表面の10～25%の範囲であれば、摩擦係数の上昇の抑制効果がある。中でも、図1に示すように凹部1bの形状を細長い溝形状とし、

その長手方向を中心軸と略直角方向にすることにより、溝の方向と磁気テープ10の走行方向とが近いことから、摩擦係数の上昇の抑制効果がさらに大きくなる。また、該形状はセンタレス研磨を行い中心軸と略直角方向の溝を作成し、その後バレル研磨により、溝間の表面を0．3s～0．5sに研磨することにより簡単に作成することができることから、製造コストも小さくすることができるという効果もある。このときの溝形状の最適値としては、溝の幅は3～5μm、長さが30～70μmである。

【0022】上記したように、本発明のガイドピン1においては、従来の磁気記録再生装置と異なる点は、ガイドピンのみであり、該ガイドピンも表面形状だけが従来と異なるだけで、材質や全体形状は同一であり、部品点数、組立行程などは従来と変わらない。さらに、簡単な加工方法で作成することができるため、コストの上昇はほとんど無い。

【0023】なお、非回転式のガイドピンにおいては、従来よりステンレス材が多く用いられており、本発明のガイドピンにおいても、もちろん同一のステンレス材を用いることが可能であるが、本発明のガイドピンにおいては、表面形状が上記形状であれば特にステンレス材でなくてもよい。

【0024】以上、本発明の一実施例の作成方法を説明したが、本発明は上記作成方法に限定されることなく、本発明の技術的思想に基づいて凹部の形状、材質などの各種の変更が可能である。

【0025】

【発明の効果】上記のように構成されたテープガイドにおいては、繰り返し走行しても摩擦係数の上昇がほとんど無いため、テンションの上昇も最小に抑えられるため、薄手テープ走行においても、ガイドローラのフランジによるテープ損傷も発生しにくい。

【0026】また、巻取リール部におけるテンションの上昇も最小に抑えられるため、巻取リールモータへの負荷の増大も少ないため、回転変動や偏差もなく安定したテープ走行を得ることができる。

【図面の簡単な説明】

【図1】本発明を適用した傾斜ガイドピン、

【図2】本発明を適用した傾斜ガイドピンの表面の一部分を拡大した平面図、

【図3】本発明を適用した傾斜ガイドピンの表面の一部分を拡大した断面図、

【図4】磁気記録再生装置の全体の概要を示す図、

【図5】摩擦係数測定機の概要を示す図、

【図6】本発明のガイドピンの摩擦係数測定結果を示す図、

【図7】従来のガイドピンの摩擦係数測定結果を示す図。

【符号の説明】

5

1…ドラム入側の傾斜ガイドピン、
2…ドラム出側の傾斜ガイドピン、
3…テンションピン、

6

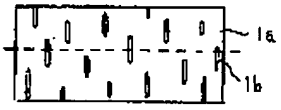
＊5、6、7、8、9…ガイドローラ、
11…テープカートリッジ、
＊　12…シャーシ。

【図1】

図1

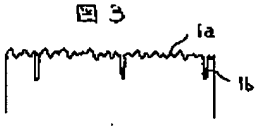
【図2】

図2



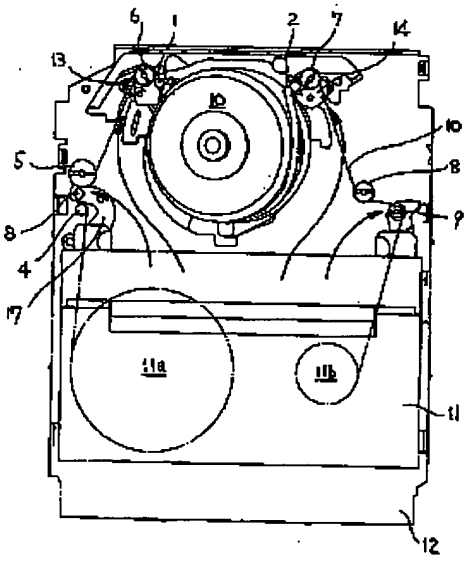
【図3】

図3



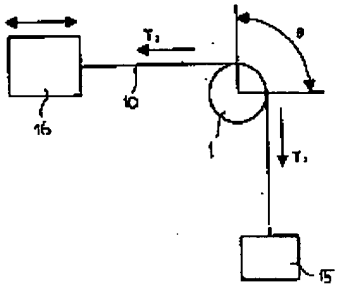
【図4】

図4



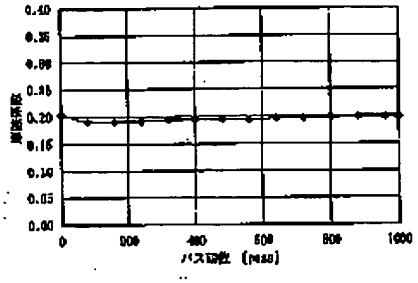
【図5】

図5



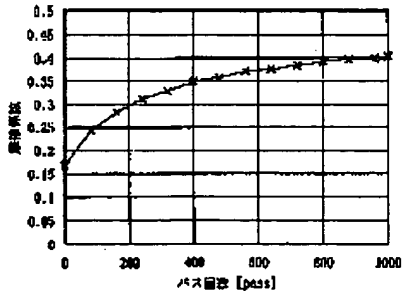
【図6】

図6



【図7】

図7



フロントページの続き

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* NOTICES *

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

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Begin Translation:

CLAIMS

[Claim 1] It is the tape guide to which surface roughness of the tape looping-around side of the aforementioned tape guide is set to 0.2s or 0.7s in the tape guide of the nonrotation formula arranged on the run way of the magnetic tape of a magnetic recorder and reproducing device, and the crevice where the depth has a depth of 1 micrometer or 100 micrometers into the portion of 5% or 30% of surface ratio of the surface area of the aforementioned tape looping-around side is characterized by the ******** bird clapper.

[Claim 2] The aforementioned surface roughness is a tape guide according to claim 1 characterized by the bird clapper, being used as 0.3 mores or 0.5s.

[Claim 3] The aforementioned surface roughness is a tape guide according to claim 1 characterized by the bird clapper, being used as 0.35 mores or 0.45s.

[Claim 4] The surface ratio in which the aforementioned crevice was established is a tape guide according to claim 1 to 3 characterized by the bird clapper, being used as 10 more% or 25%.

[Claim 5] The surface ratio in which the aforementioned crevice was established is a tape guide according to claim 1 to 3 characterized by the bird clapper, being used as 15 more% or 20%.

DETAILED DESCRIPTION

[0001]

[The technical field to which invention belongs] this invention relates to the tape guide of the nonrotation formula of magnetic recorder and reproducing devices, such as a video tape recorder (VTR) and a magnetic tape recorder.

[0002]

[Description of the Prior Art] Conventionally, in the magnetic recorder and reproducing device of helical scans, such as VTR and a magnetic tape recorder As shown in drawing 4 , supply reel 11a in a tape cartridge 11, The drum close side guides 1 and 6, the drum appearance side guides 2 and 7, and the loading member that tension pin 3 grade moves draw out the magnetic tape 10 around which take-up-reel 11b was looped in the direction of an arrow. It twists around the peripheral surface of the rotary-head drum 10 in the shape of helical one covering a predetermined angle, and a predetermined run way is formed with the non-

moving guides 4, 5, and 8 on a chassis 12. And a magnetic tape 10 carries out a fixed-speed run by the take-up-reel motor (not shown) which engages with take-up-reel 11b. At this time, it constitutes so that the rotation magnetic head (not shown) carried in the rotary-head drum 10 may perform record or reproduction of a signal to a magnetic tape 10.

[0003] Next, the guide which forms the run way of a magnetic tape 10 is explained. There are perpendicular guides (6, 7, etc.) perpendicularly twisted to a magnetic tape 10 and an inclination guide (1 2) aslant twisted to a magnetic tape 10 as guide. In a perpendicular guide, there are the erection guide pins 3 and 4 of the shape of the round bar of a nonrotation formula and rotation guide idlers 5, 6, 7, 8, and 9 which are rollers of a rotating type. Moreover, the inclination guide pins 1 and 2 of the shape of the round bar of a nonrotation formula are used for an inclination guide like the erection guide pins 3 and 4.

[0004]

[Problem(s) to be Solved by the Invention] By the way, in the rotation guide idlers 5, 6, 7, 8, and 9 of a rotating type, although most frictions with a magnetic tape 10 can be disregarded, in the guide pins 1, 2, 3, and 4 of a nonrotation formula, friction with a magnetic tape poses a problem. In a guide pin (here the drum close lateroversion slanting guide pin 1, the drum appearance lateroversion slanting guide pin 2) with an especially large contact angle with a magnetic tape, the influence of fricative is large.

[0005] Drawing 7 shows the result when measuring coefficient of friction with the base side of a magnetic tape 10 about the guide pin 1 of the conventional nonrotation formula.

[0006] The coefficient-of-friction measuring instrument shown in drawing 5 was used for measurement of this coefficient of friction. This twists a magnetic tape 10 around a guide pin 1 at predetermined contact angle theta, a load 15 (here 10g) is given to the end of a magnetic tape 10, and the magnetic tape 10 of a fixed speed (here 25 mm/s) carries out the both-way run of the other end in the direction of a repeat arrow by tape run means 16 by which the strain gage (not shown) is attached. The tape tensions T1 and T2 of the magnetic tape 10 at that time were measured, and it asked for coefficient of friction.

[0007] According to drawing 7 , although coefficient of friction of a run start of a magnetic tape 10 is 0.17, the number of times of a run is going up to 0.4 by 1000 times (one round trip is made into 1 time). It becomes large, whenever the number of times of a run of the increase in a tape tension in case a magnetic tape 10 passes a tape guide 1 will increase, if coefficient of friction with a magnetic tape 10 rises. For this reason, if it is made to run the thin thin tape of tape ** if a repeat run is performed since coefficient of friction and the tape tension of a magnetic tape 10 will become high especially, it will be easy to receive the damage of a magnetic tape 10 by the vertical flange of the guide idlers 5, 6, 7, 8, and 9 which are perpendicular guides, and the life of a magnetic tape 10 will become short.

[0008] Moreover, if coefficient of friction becomes large and a tape tension becomes high, since the load concerning the take-up-reel motor which is engaging with take-up-reel 11b will become large, rotation change and deflection become large and a run of a magnetic tape becomes unstable.

[0009] this invention was made in order to solve the above-mentioned problem, and it aims at offering the tape guide from which the tape run by which is a low cost and the magnetic tape was moreover stabilized is obtained.

[0010]

[Means for Solving the Problem] In order to solve the above-mentioned purpose, the following composition is adopted in this invention. Namely, it sets to the tape guide of the nonrotation formula arranged on the run way of the magnetic tape of a magnetic recorder and reproducing device. Surface roughness of the tape looping-around side of the aforementioned tape guide is set to 0.2s or 0.7s. the crevice where the depth has a depth of 1 micrometer or 100 micrometers into the portion of 5% or 30% of surface ratio of the surface area of the aforementioned tape looping-around side -- ******** -- it considers as the composition which is considered as composition and which comes to make the aforementioned surface roughness into 0.3 mores or 0.5s again

[0011] Moreover, the aforementioned surface roughness is taken as the composition which it comes to make into 0.35 mores or 0.45s.

[0012] Moreover, surface ratio in which the aforementioned crevice was established is taken as the composition which it comes to make into 10 more% or 25%.

[0013] Moreover, surface ratio in which the aforementioned crevice was established is taken as the composition which it comes to make into 15 more% or 20%.

[0014]

[Embodiments of the Invention] Hereafter, the tape guide of the magnetic recorder and reproducing device which applied this invention is explained with reference to drawing 1 - drawing 3 . In addition, the composition of the whole equipment excludes duplication of the same candy explanation as the former.

[0015] Drawing 1 shows the inclination guide pin 1 arranged at a drum close side. In drawing 2 , the thing and drawing 3 which expanded partial 1' shown with a slash with the minute front face of the inclination guide pin 1 shown in drawing 1 show the cross section in the dotted-line section of drawing 2 .

[0016] As shown in drawing 3 from drawing 1 , the surface roughness of the surface 1a section of the inclination guide pin 1 is 0.3s-0.5s, crevice 1b with a depth of 1 micrometers or more is prepared in the part, and the rate for which crevice 1b accounts has become 10 - 25% of the whole front face.

[0017] In addition, at least 0.2s or 0.7s, then the effect of those are acquired, and the aforementioned surface roughness is just 0.35 mores or 0.45s the optimal.

[0018] Moreover, at least 5% or 30%, then the effect of those are acquired, and the surface ratio in which the aforementioned crevice was established is just 15 more% or 20% the optimal.

[0019] The result which measured coefficient of friction of the inclination guide pin 1 of this invention and a magnetic tape 10 on the same conditions as the former is shown in drawing 6 . As shown in drawing 6 , coefficient of friction of a run start is 0.2, although it decreases to 0.19 and is increasing gradually after that to dozens of runs, even if the number of times of a run amounts to 1000 times, coefficient of friction is 0.2, and the range of fluctuation is as small as 0.01, and it turns out that there is no unusual elevation like the conventional guide pin.

[0020] The same effect is acquired even if it applies the shape of surface type of the inclination guide pin 1 shown above to all the guide pins that contact the base side side of a magnetic tape 10. Therefore, elevation of a tape tension can be suppressed to the minimum by applying also in the tension pin 3 arranged on the tension arm 17 which detects the inclination guide pin 2 and also tape tension which are arranged at a drum appearance side.

[0021] Next, the configuration of crevice 1b is explained. If the configuration of

crevice 1b is 10 - 25% of range of the above-mentioned front face, it has the depressor effect of elevation of coefficient of friction. Since the direction of a slot and the run direction of a magnetic tape 10 are near by making the configuration of crevice 1b into the shape of a long and slender quirk as shown in drawing 1 , and making the longitudinal direction into a medial axis in the abbreviation right-angled direction especially, the depressor effect of elevation of coefficient of friction becomes still larger. Moreover, since this configuration can perform center loess polish, can create the slot of a medial axis and the abbreviation right-angled direction and can create it easily by barrel finishing after that by grinding the front face between slots at 0.3s-0.5s, it has a manufacturing cost and the effect that it can be made small. As an optimum value of the shape of a quirk at this time, 3-5 micrometers and the length of the width of face of a slot are 30-70 micrometers.
[0022] As described above, in the guide pin 1 of this invention, a different point from the conventional magnetic recorder and reproducing device is only a guide pin, only the shape of surface type only differs, and that of the quality of the material or a whole configuration is the same as that of the former, and part mark, assembly distance, etc. do not change this guide pin with the former, either. Furthermore, since it can create by the easy processing method, most elevation of cost cannot be found.
[0023] In addition, in the guide pin of a nonrotation formula, although it is possible for many stainless steel material to be used conventionally and to use the same natural stainless steel material also in the guide pin of this invention, especially as long as the shape of surface type is the above-mentioned configuration, in the guide pin of this invention, you may not be stainless steel material.
[0024] As mentioned above, although the creation method of one example of this invention was explained, based on the technical thought of this invention, various kinds of change, such as a configuration of a crevice and the quality of the material, is possible for this invention, without being limited to the above-mentioned creation method.
[0025]
[Effect of the Invention] In the tape guide constituted as mentioned above, even if it runs repeatedly, in order that there may almost be no rise of coefficient of friction, it is hard to generate the rise of a tension, and tape damage according [in / a thin tape run / since it is stopped by the minimum] to the flange of a guide idler.
[0026] Moreover, since the rise of the tension in the take-up-reel section is also suppressed by the minimum, and there is also little increase of the load to a take-up-reel motor, the tape run which also has neither rotation change nor deflection and was stabilized can be obtained.

TECHNICAL FIELD

[The technical field to which invention belongs] this invention relates to the tape guide of the nonrotation formula of magnetic recorder and reproducing devices, such as a video tape recorder (VTR) and a magnetic tape recorder.

PRIOR ART

[Description of the Prior Art] Conventionally, in the magnetic recorder and reproducing device of helical scans, such as VTR and a magnetic tape recorder As shown in drawing 4 , supply reel 11a in a tape cartridge 11, The drum close side

guides 1 and 6, the drum appearance side guides 2 and 7, and the loading member that tension pin 3 grade moves draw out the magnetic tape 10 around which take-up-reel 11b was looped in the direction of an arrow. It twists around the peripheral surface of the rotary-head drum 10 in the shape of helical one covering a predetermined angle, and a predetermined run way is formed with the non-moving guides 4, 5, and 8 on a chassis 12. And a magnetic tape 10 carries out a fixed-speed run by the take-up-reel motor (not shown) which engages with take-up-reel 11b. At this time, it constitutes so that the rotation magnetic head (not shown) carried in the rotary-head drum 10 may perform record or reproduction of a signal to a magnetic tape 10.

[0003] Next, the guide which forms the run way of a magnetic tape 10 is explained. There are perpendicular guides (6, 7, etc.) perpendicularly twisted to a magnetic tape 10 and an inclination guide (1 2) aslant twisted to a magnetic tape 10 as guide. In a perpendicular guide, there are the erection guide pins 3 and 4 of the shape of the round bar of a nonrotation formula and rotation guide idlers 5, 6, 7, 8, and 9 which are rollers of a rotating type. Moreover, the inclination guide pins 1 and 2 of the shape of the round bar of a nonrotation formula are used for an inclination guide like the erection guide pins 3 and 4.

EFFECT OF THE INVENTION

In the tape guide constituted as mentioned above, even if it runs repeatedly, in order that there may almost be no rise of coefficient of friction, it is hard to generate the rise of a tension, and tape damage according [in / a thin tape run / since it is stopped by the minimum] to the flange of a guide idler.

[0026] Moreover, since the rise of the tension in the take-up-reel section is also suppressed by the minimum, and there is also little increase of the load to a take-up-reel motor, the tape run which also has neither rotation change nor deflection and was stabilized can be obtained.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] By the way, in the rotation guide idlers 5, 6, 7, 8, and 9 of a rotating type, although most frictions with a magnetic tape 10 can be disregarded, in the guide pins 1, 2, 3, and 4 of a nonrotation formula, friction with a magnetic tape poses a problem. In a guide pin (here the drum close lateroversion slanting guide pin 1, the drum appearance lateroversion slanting guide pin 2) with an especially large contact angle with a magnetic tape, the influence of fricative is large.

[0005] Drawing 7 shows the result when measuring coefficient of friction with the base side of a magnetic tape 10 about the guide pin 1 of the conventional nonrotation formula.

[0006] The coefficient-of-friction measuring instrument shown in drawing 5 was used for measurement of this coefficient of friction. This twists a magnetic tape 10 around a guide pin 1 at predetermined contact angle theta, a load 15 (here 10g) is given to the end of a magnetic tape 10, and the magnetic tape 10 of a fixed speed (here 25 mm/s) carries out the both-way run of the other end in the direction of a repeat arrow by tape run means 16 by which the strain gage (not shown) is attached. The tape tensions T1 and T2 of the magnetic tape 10 at that time were measured, and it asked for coefficient of friction.

[0007] According to drawing 7 , although coefficient of friction of a run start of a magnetic tape 10 is 0.17, the number of times of a run is going up to 0.4 by 1000 times (one round trip is made into 1 time). It becomes large, whenever the number of times of a run of the increase in a tape tension in case a magnetic tape 10 passes a tape guide 1 will increase, if coefficient of friction with a magnetic tape 10 rises. For this reason, if it is made to run the thin thin tape of tape ** if a repeat run is performed since coefficient of friction and the tape tension of a magnetic tape 10 will become high especially, it will be easy to receive the damage of a magnetic tape 10 by the vertical flange of the guide idlers 5, 6, 7, 8, and 9 which are perpendicular guides, and the life of a magnetic tape 10 will become short.
[0008] Moreover, if coefficient of friction becomes large and a tape tension becomes high, since the load concerning the take-up-reel motor which is engaging with take-up-reel 11b will become large, rotation change and deflection become large and a run of a magnetic tape becomes unstable.
[0009] this invention was made in order to solve the above-mentioned problem, and it aims at offering the tape guide from which the tape run by which is a low cost and the magnetic tape was moreover stabilized is obtained.

MEANS

[Means for Solving the Problem] In order to solve the above-mentioned purpose, the following composition is adopted in this invention. Namely, it sets to the tape guide of the nonrotation formula arranged on the run way of the magnetic tape of a magnetic recorder and reproducing device. Surface roughness of the tape looping-around side of the aforementioned tape guide is set to 0.2s or 0.7s. the crevice where the depth has a depth of 1 micrometer or 100 micrometers into the portion of 5% or 30% of surface ratio of the surface area of the aforementioned tape looping-around side -- ******** -- it considers as the composition which is considered as composition and which comes to make the aforementioned surface roughness into 0.3 mores or 0.5s again
[0011] Moreover, the aforementioned surface roughness is taken as the composition which it comes to make into 0.35 mores or 0.45s.
[0012] Moreover, surface ratio in which the aforementioned crevice was established is taken as the composition which it comes to make into 10 more% or 25%.
[0013] Moreover, surface ratio in which the aforementioned crevice was established is taken as the composition which it comes to make into 15 more% or 20%.
[0014]
[Embodiments of the Invention] Hereafter, the tape guide of the magnetic recorder and reproducing device which applied this invention is explained with reference to drawing 1 - drawing 3 . In addition, the composition of the whole equipment excludes duplication of the same candy explanation as the former.
[0015] Drawing 1 shows the inclination guide pin 1 arranged at a drum close side. In drawing 2 , the thing and drawing 3 which expanded partial 1' shown with a slash with the minute front face of the inclination guide pin 1 shown in drawing 1 show the cross section in the dotted-line section of drawing 2 .
[0016] As shown in drawing 3 from drawing 1 , the surface roughness of the surface 1a section of the inclination guide pin 1 is 0.3s-0.5s, crevice 1b with a depth of 1 micrometers or more is prepared in the part, and the rate for which

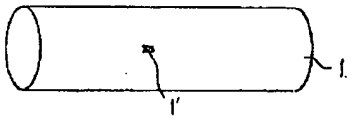
crevice 1b accounts has become 10 - 25% of the whole front face.
[0017] In addition, at least 0.2s or 0.7s, then the effect of those are acquired, and the aforementioned surface roughness is just 0.35 mores or 0.45s the optimal.
[0018] Moreover, at least 5% or 30%, then the effect of those are acquired, and the surface ratio in which the aforementioned crevice was established is just 15 more% or 20% the optimal.
[0019] The result which measured coefficient of friction of the inclination guide pin 1 of this invention and a magnetic tape 10 on the same conditions as the former is shown in drawing 6 . As shown in drawing 6 , coefficient of friction of a run start is 0.2, although it decreases to 0.19 and is increasing gradually after that to dozens of runs, even if the number of times of a run amounts to 1000 times, coefficient of friction is 0.2, and the range of fluctuation is as small as 0.01, and it turns out that there is no unusual elevation like the conventional guide pin.
[0020] The same effect is acquired even if it applies the shape of surface type of the inclination guide pin 1 shown above to all the guide pins that contact the base side side of a magnetic tape 10. Therefore, elevation of a tape tension can be suppressed to the minimum by applying also in the tension pin 3 arranged on the tension arm 17 which detects the inclination guide pin 2 and also tape tension which are arranged at a drum appearance side.
[0021] Next, the configuration of crevice 1b is explained. If the configuration of crevice 1b is 10 - 25% of range of the above-mentioned front face, it has the depressor effect of elevation of coefficient of friction. Since the direction of a slot and the run direction of a magnetic tape 10 are near by making the configuration of crevice 1b into the shape of a long and slender quirk as shown in drawing 1 , and making the longitudinal direction into a medial axis in the abbreviation right-angled direction especially, the depressor effect of elevation of coefficient of friction becomes still larger. Moreover, since this configuration can perform center loess polish, can create the slot of a medial axis and the abbreviation right-angled direction and can create it easily by barrel finishing after that by grinding the front face between slots at 0.3s-0.5s, it has a manufacturing cost and the effect that it can be made small. As an optimum value of the shape of a quirk at this time, 3-5 micrometers and the length of the width of face of a slot are 30-70 micrometers.
[0022] As described above, in the guide pin 1 of this invention, a different point from the conventional magnetic recorder and reproducing device is only a guide pin, only the shape of surface type only differs, and that of the quality of the material or a whole configuration is the same as that of the former, and part mark, assembly distance, etc. do not change this guide pin with the former, either. Furthermore, since it can create by the easy processing method, most elevation of cost cannot be found.
[0023] In addition, in the guide pin of a nonrotation formula, although it is possible for many stainless steel material to be used conventionally and to use the same natural stainless steel material also in the guide pin of this invention, especially as long as the shape of surface type is the above-mentioned configuration, in the guide pin of this invention, you may not be stainless steel material.
[0024] As mentioned above, although the creation method of one example of this invention was explained, based on the technical thought of this invention, various kinds of change, such as a configuration of a crevice and the quality of the material, is possible for this invention, without being limited to the above-mentioned creation method.

DESCRIPTION OF DRAWINGS

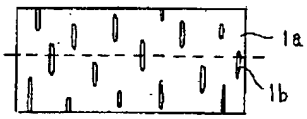
[Brief Description of the Drawings]
[Drawing 1] The inclination guide pin which applied this invention,
[Drawing 2] The plan to which a part of front face of the inclination guide pin which applied this invention was expanded,
[Drawing 3] The cross section to which a part of front face of the inclination guide pin which applied this invention was expanded,
[Drawing 4] Drawing showing the outline of the whole magnetic recorder and reproducing device,
[Drawing 5] Drawing showing the outline of a coefficient-of-friction measurement machine,
[Drawing 6] Drawing showing the coefficient-of-friction measurement result of the guide pin of this invention,
[Drawing 7] Drawing showing the coefficient-of-friction measurement result of the conventional guide pin.
[Description of Notations]
1 -- Inclination guide pin by the side of drum close,
2 -- It is a near inclination guide pin with a drum.
3 -- Tension pin,
5, 6, 7, 8, 9 -- Guide idler
11 -- Tape cartridge
12 -- Chassis.

DRAWINGS

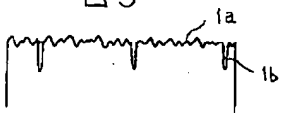
[Drawing 1]
図 1



[Drawing 2]
図 2

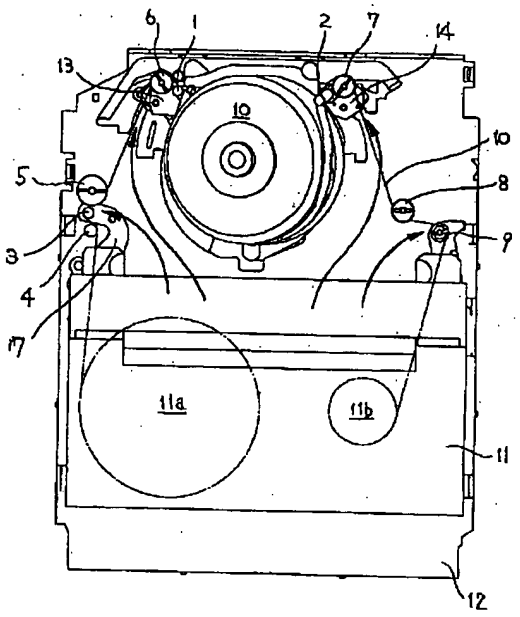


[Drawing 3]
図 3



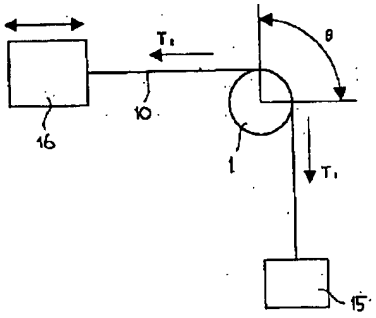
[Drawing 4]

図4



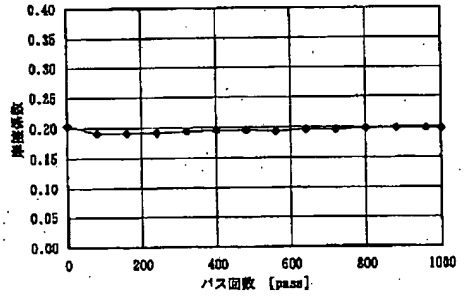
[Drawing 5]

図5



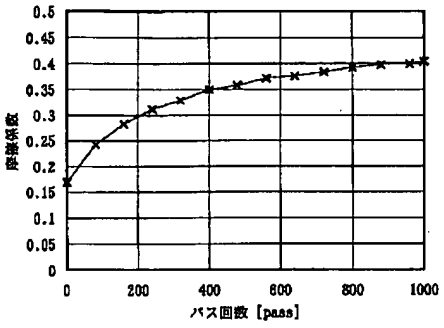
[Drawing 6]

図6



[Drawing 7]

図 7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